

What I claim is:

1. An article comprising a machine-accessible medium having stored thereon instructions that, when executed by a machine, cause the machine to:
 - obtain from a performance monitor runtime performance data indicative of a thread-level utilization; and
 - based on the performance data, adjust an operating voltage or an operating frequency of the machine.
2. The article of claim 1, wherein the performance monitor is a Performance Monitoring Unit (PMU).
3. The article of claim 2, wherein the PMU is part of a central processing unit (CPU) within the machine.
4. The article of claim 2, wherein the PMU includes a plurality of counters for measuring different performance data.
5. The article of claim 1, wherein the runtime performance data is selected from the group consisting of instruction cache misses, data cache misses, instructions executed, branches executed, branch mis-predicts, instruction translation look-up buffer TLB misses, data translation look-up buffer TLB misses, stalls due to data dependency, and data cache write-backs.
6. The article of claim 1, having further instructions that, when executed by the machine, cause the machine to:
 - in response to the performance data, determine if the operating voltage and operating frequency should be adjusted upward or scaled down.

7. The article of claim 6, having further instructions that, when executed by the machine, cause the machine to:

compare the performance data to a voltage and frequency scheduler lookup table that stores at least one voltage value and at least one frequency value.

8. The article of claim 1, having further instructions that, when executed by the machine, cause the machine to:

obtain a plurality of runtime performance data; and

in response to the plurality of runtime performance data, adjusting the operating voltage and the operating frequency.

9. The article of claim 1, wherein the performance data is an instructions-per-cycle metric.

10. The article of claim 1, wherein the performance data is a memory references-per-cycle metric.

11. The article of claim 1, having further instructions that, when executed by the machine, cause the machine to:

operate the performance monitor in an operating system environment in communication with a platform hardware environment, in a kernel mode, and in communication with an end user code, in a user mode.

12. The article of claim 1, wherein the instructions, when executed by the machine, cause the machine to adjust the operating voltage and the operating frequency.

13. A method comprising:
- obtaining, from a performance monitor, runtime performance data indicative of a thread-level utilization for a central processing unit (CPU) having an operating voltage and an operating frequency;
- in response to the runtime performance data, determining if either the operating voltage or the operating frequency is at a desired value; and
- in response to the determination, adjusting the operating voltage or the operating frequency.
14. The method of claim 13, further comprising:
- adjusting both the operating voltage and the operating frequency.
15. The method of claim 14, further comprising adjusting the operating voltage and the operating frequency upward.
16. The method of claim 14, further comprising adjusting the operating voltage and the operating frequency downward.
17. The method of claim 13, wherein the performance monitor is a Performance Monitoring Unit (PMU).
18. The method of claim 13, wherein the runtime performance data is selected from the group consisting of instruction cache misses, data cache misses, instructions executed, branches executed, branch mis-predicts, instruction translation look-up buffer misses, data translation look-up buffer misses, stalls due to data dependency, and data cache write-backs.

19. The method of claim 13, further comprising comparing the performance data to a voltage and frequency scheduler lookup table that includes at least one voltage value and at least one frequency value.

20. The method of claim 19, further comprising:
benchmarking the CPU;
determining the at least one voltage value and the at least one frequency value in response to the benchmarking; and
creating a lookup table of the at least one voltage value and the at least one frequency value.

21. The method of claim 13, further comprising adjusting the operating voltage or the operating frequency in response to an instructions-per-cycle metric or a memory-references-per-cycle metric.